Trying to Understand moments of distributions in EndCap SMD within the 25 x 25 strip events in text files from IUCF.

Preliminary version 1

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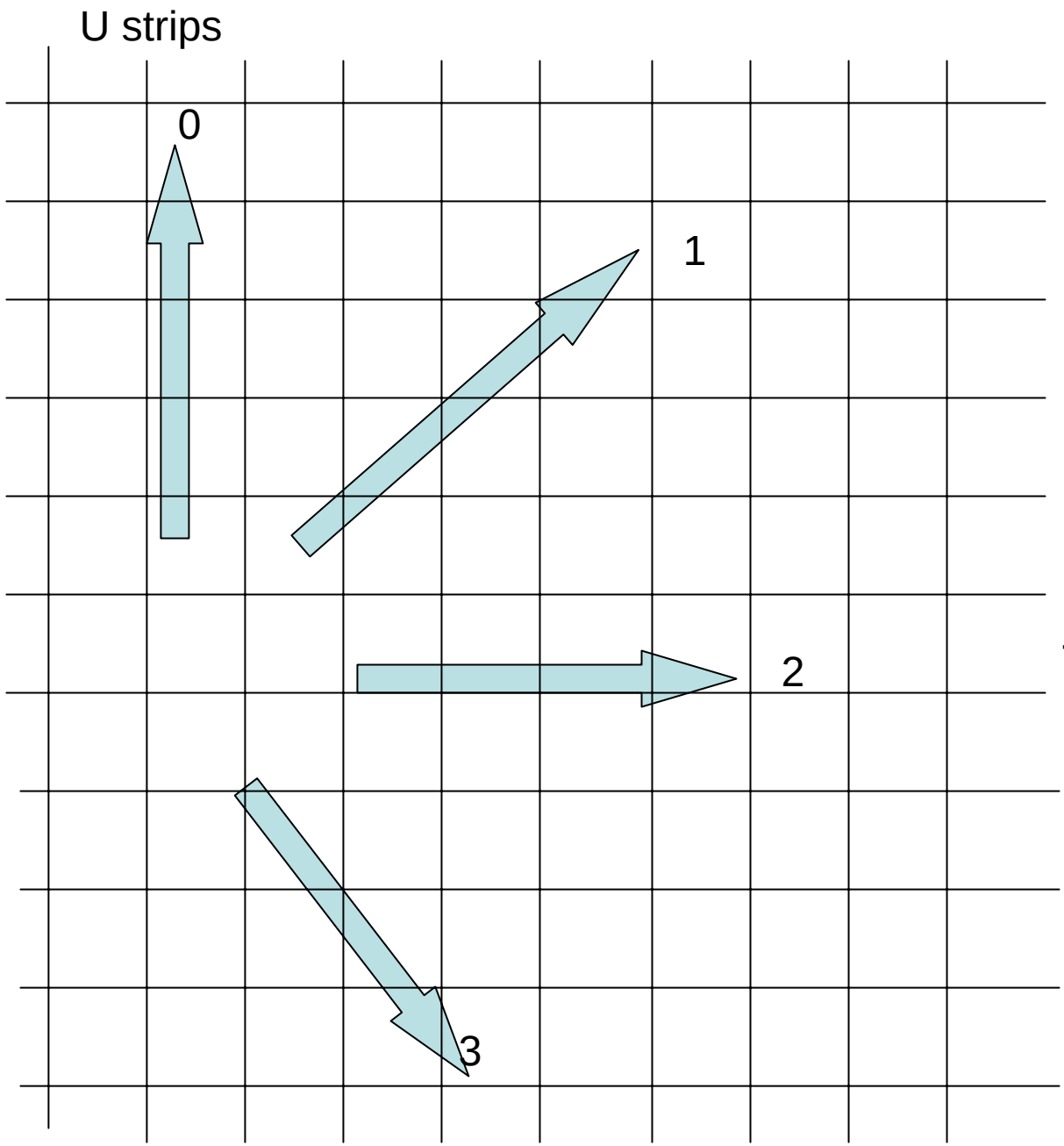


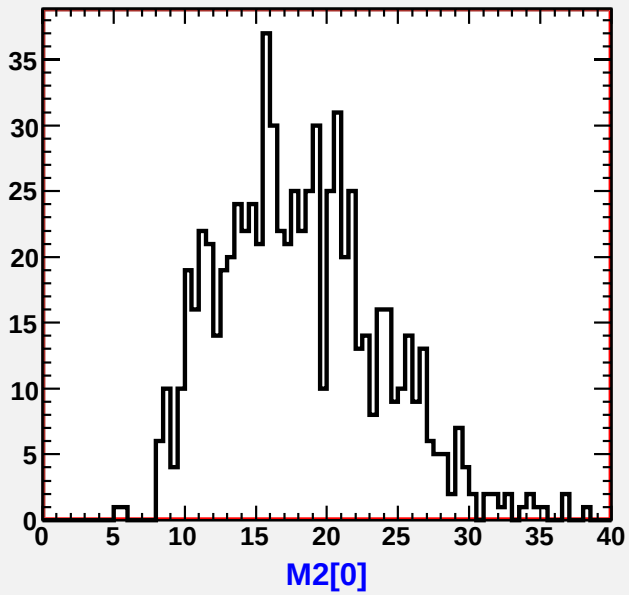
Find second (third) moments along 4 directions.

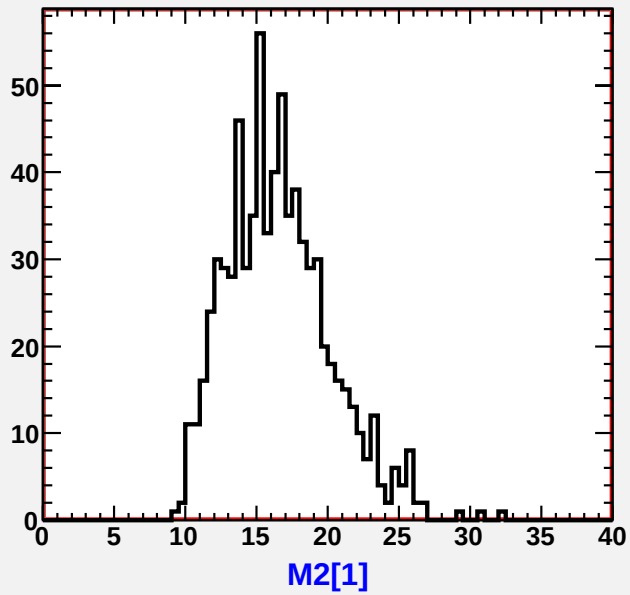
Maybe elliptical energy distribution?

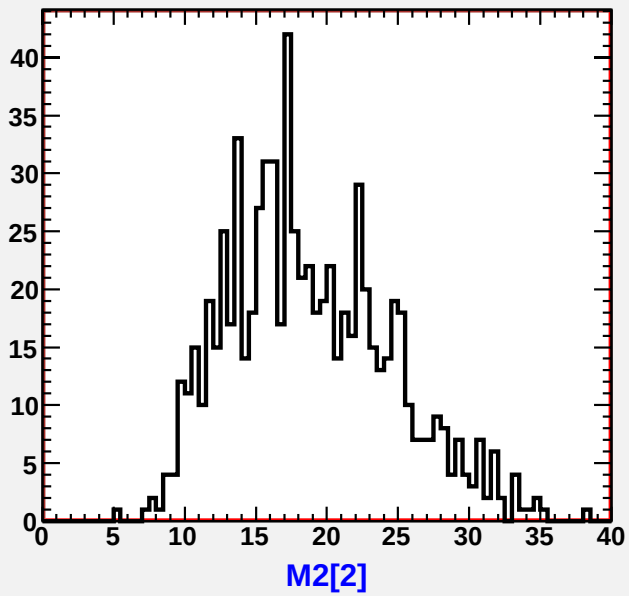
Maybe skewed energy distribution?

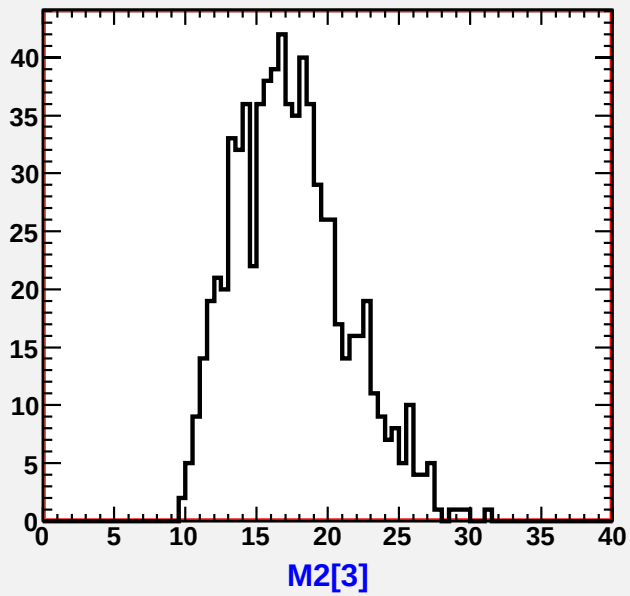
Use 25 strips Perp to moment, and 5 on either side.

Use geometric mean Energy in cross pixel


0 5 10 15 20 25 30 35 40
0 5 10 15 20 25 30 35
M2[0]


0 5 10 15 20 25 30 35 40
0 10 20 30 40 50
M2[1]


0 5 10 15 20 25 30 35 40
0 5 10 15 20 25 30 35 40
M2[2]


0 5 10 15 20 25 30 35 40
0 5 10 15 20 25 30 35 40
M2[3]

Diagonal moments are smaller.

I thought this was a code bug, but it looks more like it could come from extra energy in strips outside the 25 x 25 crossing area of the photon candidate.

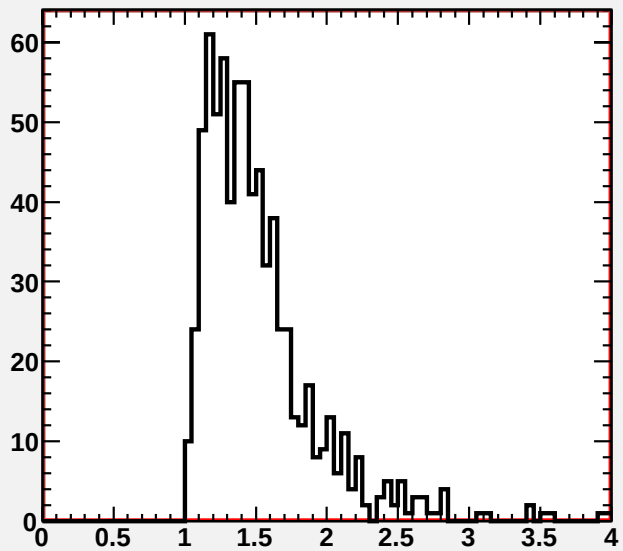
Note in the next slide that the first moments have a distribution around the peak of the distribution. They are not all centered in strip 12.

I use sum (E*(U- meanU)^2) / (sum E) for moments

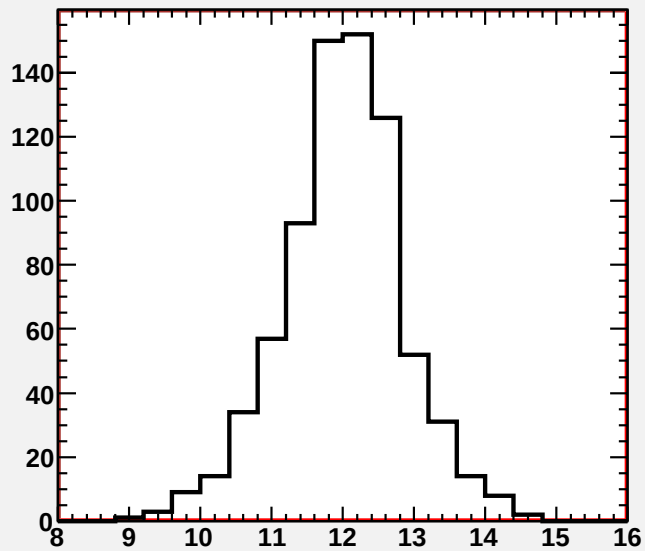
Where E is sqrt(Eu * Ev) at crossing of strips.

The last slide shows no particular correlation of moment with Energy.

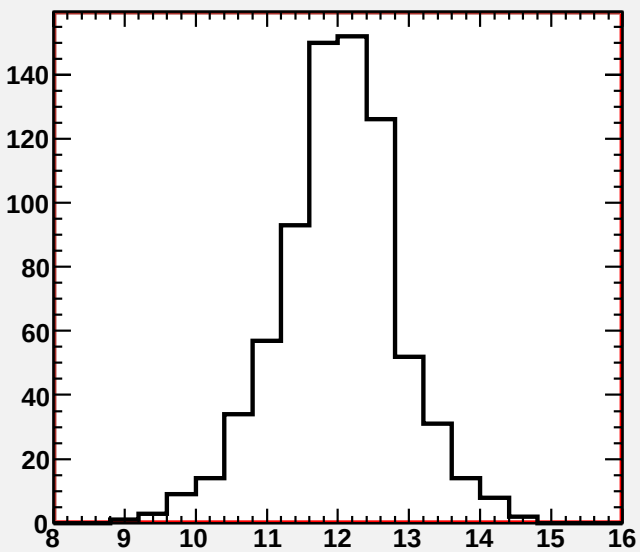
All these have Preshower 1 = 0. A comparison is the next job.



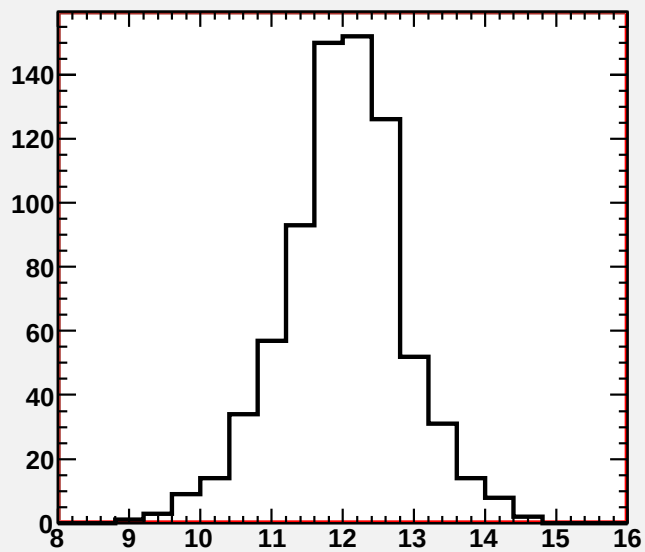
M2ratio



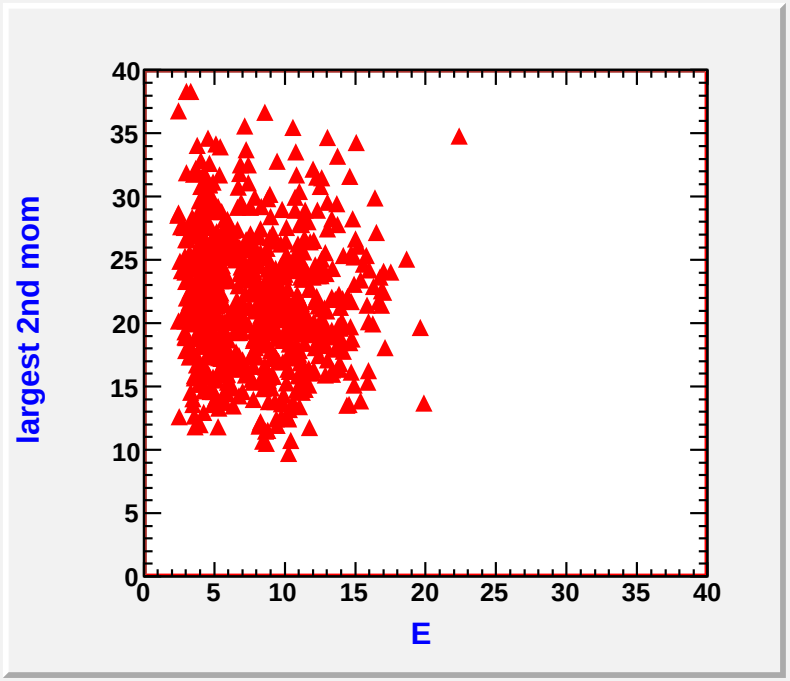
meanU

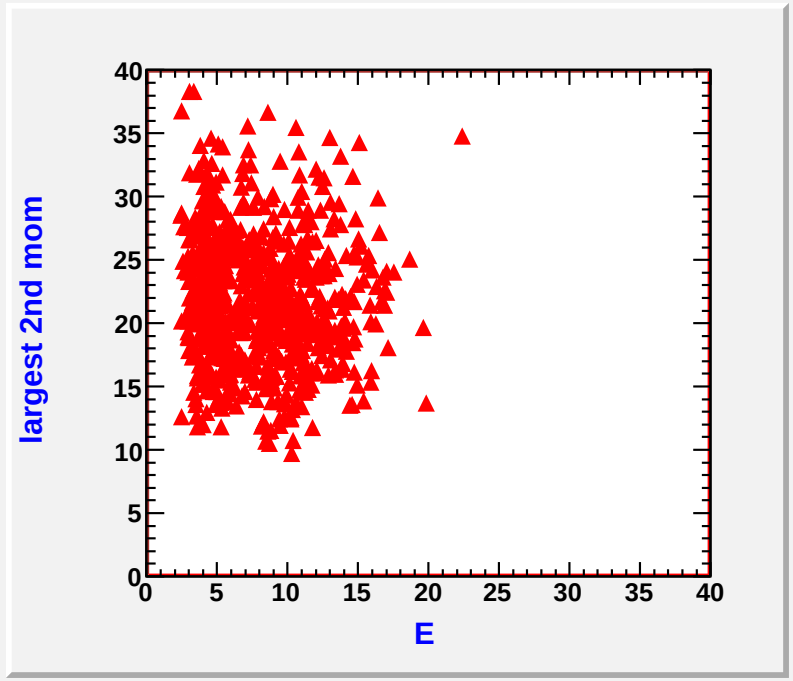


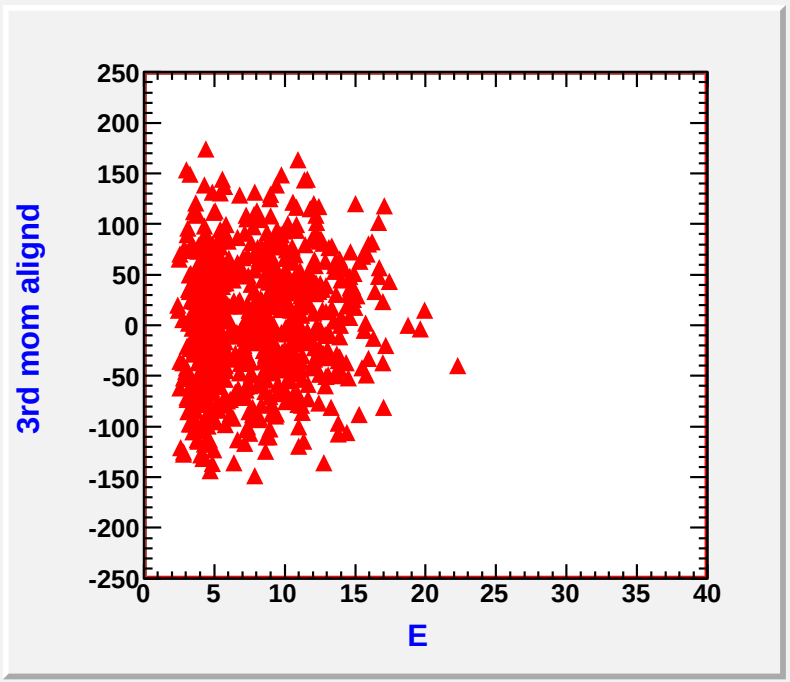
meanU

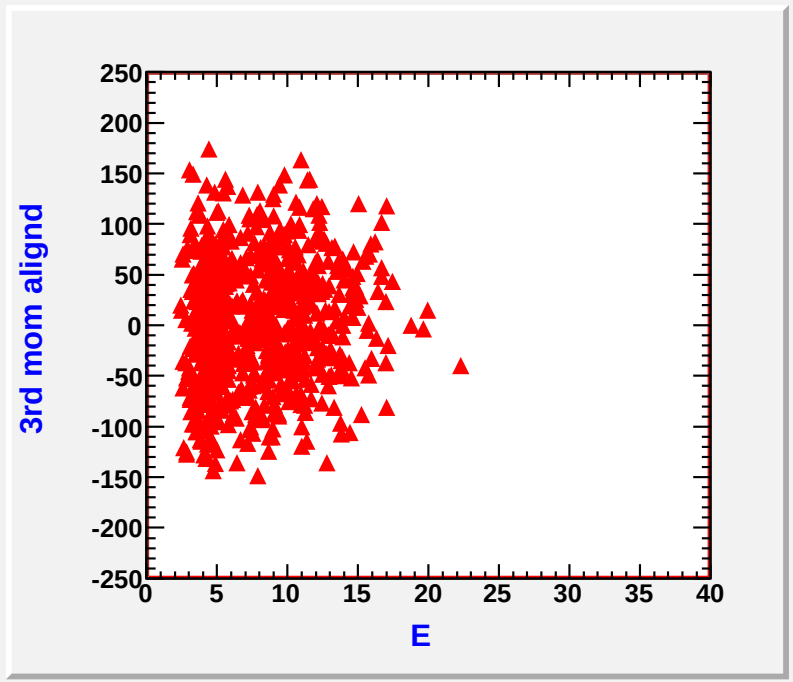


meanU


largest 2nd mom
E
0
5
10
15
20
25
30
35
40


largest 2nd mom
E
0
5
10
15
20
25
30
35
40


3rd mom alignd
E
250
200
150
100
50
0
-50
-100
-150
-200
-250
0
5
10
15
20
25
30
35
40


3rd mom alignd
E
250
200
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100
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0
-50
-100
-150
-200
-250
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15
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25
30
35
40